

Electra[®] X2S

ADVANCED MEDIA PROCESSOR



The Harmonic Electra[®] X2S advanced media processor converges the essential components of a video headend onto a cost-effective 1-RU platform.

Featuring integrated real-time encoding, network management, multiplexing, and high-quality graphics and branding, Electra X2S offers broadcasters, pay-TV operators and content providers market-leading video quality, unparalleled function integration and increased operational flexibility.

At the heart of Electra X2S is the Harmonic PURE Compression Engine™, an advanced encoding technology that supports SD and HD formats, and MPEG-2, MPEG-4 AVC and HEVC codecs for broadcast and OTT multiscreen delivery. The Harmonic PURE Compression Engine powers Electra X2S with superior video quality at minimum bandwidth. Users can also employ EyeQ™ real-time video optimization, Harmonic's optional enhancement for PURE Compression that ensures delivery of the highest video quality across IPTV or OTT delivery networks while reducing bandwidth consumption by up to 50%.

Harmonic's industry-leading function integration achieves its highest level in Electra X2S. Statistical multiplexing capabilities previously available only on Harmonic ProStream® stream processors, and management functionality from the Harmonic NMX™ Digital Service Manager™ come standard. The addition of on-board video graphics and branding bring new levels of workflow efficiency to the video delivery chain, a capability that also preserves video quality by removing the need to inject baseband components into the IP workflow. Rich audio functionality includes encoding of Dolby® Digital Plus (E-AC-3) content and integrated audio leveling. Reducing the number of discrete boxes in the broadcast chain reduces network complexity, resulting in an operation that is easier to set up, manage and maintain.

The Electra X2S processor maximizes the efficiency and flexibility of multiplexing by integrating Harmonic Flexstream™ IP (formerly DiviTrackIP™) statmux technology in the same chassis as the encoder. Unique capabilities include support for distributed statmuxing and Flexstream Convergence, in which a target average bitrate can be set for each service within a statmux pool. Especially useful for broadcasters with Channel Sharing Agreements, Flexstream Convergence enables bandwidth savings over a specified period of time while maintaining high video quality.

Easy to use, the Electra X2S user interface builds on NMX to offer a powerful set of tools for monitoring and managing compressed digital video and audio systems. Service status, including alarms, is passed through to the top level, ensuring that problems are quickly detected and resolved. Adding, reconfiguring or removing services or equipment is fast, easy and error-free. Templating, wizards, consolidated data views and powerful cut-and-paste functions are also available for both service and system modifications.

As a next-generation media processing system, Electra X2S offers a new approach to video distribution and delivery workflows. With its industry-leading video quality, function integration, bandwidth efficiency and workflow flexibility, this multi-service, multi-codec, multi-function "headend-in-a-box" reduces the number of devices required to build out a broadcast transmission chain, saving on both CAPEX and OPEX, and delivering exceptionally low total cost of ownership (TCO). The integrated capabilities of Electra X2S also accelerate your ability to quickly launch revenue-generating services, such as new HD channels and OTT channels featuring live and time-shifted content.

HIGHLIGHTS

- SD/HD MPEG-2, MPEG-4 AVC and HEVC encoding for broadcast and OTT multiscreen services
- Harmonic PURE Compression Engine and EyeQ technologies for market-leading video quality at the lowest bitrates
- Flexstream IP statistical multiplexing, including the ability to set target bitrates for each program in a pool
- Broadcast-grade up-conversion
- Slate insertion for service disruption messages
- Rich audio functionality, including AC-4, E-AC-3 encoding and Jünger Level Magic audio level adjustment
- SCTE 27 or Teletext to DVB subtitling

SPECIFICATIONS

INPUT/OUTPUT

Connectors	Two dedicated TS inputs Two dedicated TS outputs Two dedicated management ports
3G/HD/SD-SDI Input	3G/HD/SD-SDI Input Eight or Sixteen Mini DIN ports (optional)
ASI output	Eight Mini DIN ports

DECODING

Video (4:2:0/4:2:2)	MPEG-2, MPEG-4 AVC Up to 1080p @ 59.94
Audio	MPEG-1 Layer II, AC-3, E-AC-3, Dolby E, HE-AAC Mono, stereo, multichannel

BROADCAST VIDEO PROCESSING

Codecs	MPEG-2 MP @ ML MPEG-2 MP @ HL MPEG-4 AVC MP @ L3 MPEG-4 AVC HP @ L4 HEVC Main 10
SD Resolutions and Frame Rates	576i @ 25 480i @ 29.97
HD Resolutions and Frame Rates	720p @ 50 and 59.94 1080i @ 25 and 29.97 1080p @ 24, 50 and 59.94
Up/Down/Cross-Conversion	480i @ 29.97, 720p @ 59.94, and 1080i @ 29.97 576i @ 25, 720p @ 50, and 1080i @ 25 720p @ 59.94 and 1080i @ 29.97 or 1080i @ 29.97 and 720p @ 59.94
Processing Capabilities	Scene-cut and fade/dissolve detection Dynamic GOP management with adaptive I-frame insertion CBR, VBR (DToIP statmux with ProStream 9100)
Video Pre-Processing	Hierarchical LookAhead™ Motion-compensated temporal filtering (MCTF) Horizontal filter

MULTISCREEN VIDEO PROCESSING

Codecs	AVC (H.264) Main, Baseline HEVC Main 10
Video Optimization	Harmonic EyeQ
Container	TS over UDP, each video delivered as a separate SPTS
Aspect Ratio Handling	4:3, 16:9

AUDIO PROCESSING

Codecs	MPEG-1 Layer II (stereo) AC-3, E-AC-3, MPEG-2/4 AAC LC (ADTS/LATM), MPEG-4 HE-AAC v1/2 (ADTS/LATM) (stereo and 5.1 surround)
Input	Embedded or TS
Level Control	Jünger Level Magic audio level adjustment
Audio Watermarking	Nielsen
Audio Description	Receiver mix

ANCILLARY DATA SPECIFICATION

Closed Captions	EIA-608 EIA 708 ATSC A/53 608/708 conversion option ARIB China closed caption
VANC Data	Teletext WSS AFD VITC
Digital Program Insertion (DPI)	SCTE 104 over Ethernet SCTE 104/VANC to SCTE 35

GRAPHICS & BRANDING

Adobe Creative Suite compatibility	
Integrated DVE	
Independent branding for each service	
Up to 8 layers of graphics	
Logo insertion	
Support for all standard image formats (PNG, JPG, TIFF, GIF), sequences (Targa, FLV) and typefaces	

SYSTEM MANAGEMENT

Harmonic NMX™ Digital Service Manager	
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POWER

Power Supply	Dual, hot-swappable from rear
Input Voltage Range	90-264 VAC
Input Frequency Range	47-63 Hz
Power Consumption	400 W typical, 510 W max

PHYSICAL

Dimensions (W x H x D)	17.67 in x 1.7 in x 27.75 in (1 RU) 44.9 cm x 4.32 cm x 70.5 cm
Weight	36 lbs/16.33 kg

ENVIRONMENTAL

Cooling	Front to rear airflow Temperature-controlled fans
Operating Temperature	+32° to +95° F 0° to +35° C
Storage Temperature	-40° to +158° F -40° to +70° C
Operating Humidity	<95% non-condensing
Safety	IEC/EN 60950-1 CAN/CSA-C22.2 No. 60950-1 BIS IS13252 (Part 1):2010 NOM-19-SCFI-1998
Electromagnetic Compatibility	EN55022:2010 EN55024:2010 ICES-003, Issue 5:2012, Class A 47 CFR, FCC Part 15, Subpart B, Class A AS/NZS CISPR22 KN 22 and KN 24 VCCI V-3/2011

ORDERING INFORMATION

Part Number	Description
ELC-X2S-ATSC-IP	Electra X2S advanced compression platform for ATSC applications
ELC-X2S-DVB-IP	Electra X2S advanced compression platform for DVB applications
ELC-X2S-G2-AC-GG-S	ELC-X2S chassis, 8 SDI input, IP output
ELC-X2S-G2-AC-GG-SA	ELC-X2S chassis, 8 SDI input, ASI and IP output